

## Abstract

A multiturn angle measuring device (1) with a first dimensional standard (9) that is non-rotatably connected to an input shaft (2) and which is sampled by a first scanning unit (10) to determine the angular position of the input shaft. Additional dimensional standards (11, 12, 13) measure the number of turns of the input shaft (2) and are arranged in parallel to each other. The rotational speed of each additional dimensional standard (11, 12, 13) is reduced by means of a reduction gearing from the preceding dimensional standard (9, 11, 12). A scanning device (21, 22, 23) for the sampling of each dimensional standard (11, 12, 13) is arranged on a circuit board (6). To provide a multiturn shaft encoder able to measure a high number of turns, even at high rotational speeds and/or large diameter input shafts, with compact construction and comparatively few multiturn stages, the input drive gear (40) fixed to the input shaft (2) and the first driven transmission gear (41) have axes of rotation ( $D_{40}$ ,  $D_{41}$ ) that are not parallel to each other. The flanks of the teeth ( $Z_{40}$ ,  $Z_{41}$ ) of the input drive gear (40) and of the wheel (411) of the first driven transmission gear (41) are not parallel to the axes of rotation ( $D_{40}$ ,  $D_{41}$ ) of the respective gears (40, 41), and the number of teeth ( $Z_{40}$ ) of the input gear (40) is smaller than the number of teeth ( $Z_{41}$ ) of the wheel (411) of the first transmission gear (41). The following transmission gears are again arranged parallel to the input shaft, and the drive pinion (412) of the first transmission gear (41) and the driven wheel of the second transmission gear (31) have helical gears.

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